m -5-

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
| --- | --- | --- | --- | --- |
| 10/752,935 | 01/06/2004 | Joel Christopher Kent | 73-7036732001 (ELG058 US1 | 5780 |

7590 08/22/2006

| EXAMINER | |
| --- | --- |
| LUI, DONNA V | |
| ART UNIT | PAPER NUMBER |
| 2629 | |

Tyco Electronics Corporation
307 Constitution Drive, MS R20/2B
Menlo Park, CA 94025-1164

DATE MAILED: 08/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/752,935 | KENT, JOEL CHRISTOPHER | |
| | Examiner | Art Unit | |
| | Donna V. Lui | 2629 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *6 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/6/2004*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. **Claims 1-3, 12, 13, 15, 16, 18-20, and 22** are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant Admitted Prior Art (herein after referred to as "AAPA").

With respect to **Claim 1**, AAPA teaches a touchscreen *(See figure 1)*, comprising: a substrate *(See figure 2, element 18)* capable of propagating acoustic waves *(See figure 2, element 11a)*, the substrate having a touch-sensitive area *(See figure 1, element 2; [0002], lines 1-4)*; and an array of acoustically reflective elements *(See figure 1, element 4; See figure 2, element 14)* lying in the substrate, the array having an axis *(See figure 1, the axis is parallel to acoustic waves 11a along the x-axis, the axis having traveling waves parallel to the Y-axis)*, the reflective array elements positioned at an angle relative to the array axis to transmit or receive acoustic signals into or out of the touch-sensitive area *([0002], lines 12-18)*. It is inherent that AAPA teaches the reflective array elements having a focusing shape, since a point at which rays of light diverge, as after reflection have a focal point, then the reflective array elements must have a focusing shape *(See figure 2, element 14, note that the shape is a rectangular plane)*.

With respect to **<u>Claim 22</u>**, AAPA teaches a touchscreen *(See figure 1)*, comprising: a substrate *(See figure 2, element 18)* capable of propagating acoustic waves *(See figure 2, element 11a)*, the substrate having a touch-sensitive area *(See figure 1, element 2; [0002], lines 1-4)* and a border region adjacent the touch-sensitive area *(See figure 1, element 15; [0006], lines 9-12)*; a first array of acoustically reflective elements lying in or on the substrate and positioned in a first portion of the border region for transmitting acoustic signals into the touch-sensitive area *(See figure 1, element 13: acoustically reflective elements lying along the x-axis parallel to 11a and 11b; [0002], lines 12-18)*, the first array having a first array axis *(x-axis)*; and a second array of acoustically reflective elements lying in or on the substrate and positioned in a second portion of the border region to receive acoustic signals transmitted by the first array after the acoustic signals have traveled across the touch-sensitive area *(See figure 1, element 13: acoustically reflective elements lying along the y-axis parallel to elements 5a and 5b; [0004], lines 6-12; [0006], lines 9-12)*, the second array having a second array axis *(y-axis)*. It is inherent that AAPA teaches the first and second reflective array elements having a focusing shape, since a point at which rays of light diverge, as after reflection have a focal point, then the reflective array elements must have a focusing shape *(See figure 2, element 14, note that the shape is a rectangular plane)*.

With respect to **<u>Claim 15</u>**, claim 15 differs from claim 22 only in that claim 22 is narrower than claim 15 and that claim 22 incorporates all the limitations of claim 15. Thus, claim 15 is analyzed as previously discussed with respect to claim 22.

With respect to **Claim 2**, the touchscreen of claim 1, AAPA teaches at least one reflective array element *(See figure 2, element 14)* located on a surface of the substrate *(element 18: waveguide core)*.

With respect to **Claim 3**, the touchscreen of claim 1, AAPA teaches at least one reflective array element at least partially embedded in the substrate *(See figure 2, element 14)*.

With respect to **Claim 12**, the touchscreen of claim 1, AAPA teaches a waveguide core *(See figure 2, element 18; note that the waveguide core extends along the x and y axis, thus the waveguide core is substantially aligned with the array axis)* substantially aligned with the array axis.

With respect to **Claim 13**, the touchscreen of claim 12, AAPA teaches the reflective array elements overlaying the waveguide core *([0007], lines 12-14)*.

With respect to **Claim 16**, the touchscreen of claim 15, AAPA teaches the first reflective array having a first array axis *(See figure 1, element 13: acoustically reflective elements lying along the x-axis parallel to 11a and 11b; x-axis)*, the second reflective array having a second array axis *(See figure 1, element 13: acoustically reflective elements lying along the y-axis parallel to elements 5a and 5b; y-axis)*, further comprising a first transducer *(See figure 1, element 3a)* acoustically coupled to the

substrate and positioned to transmit an acoustic signal along the first array axis *([0002], lines 6-9)*, and a second transducer *(See figure 1, element 6a)* acoustically coupled to the substrate and positioned to receive an acoustic signal traveling along the second array axis *([0004], lines 6-12)*.

With respect to **Claim 18**, the touchscreen of claim 15, AAPA teaches the first reflective array having a first array axis *(See figure 1, element 13: acoustically reflective elements lying along the x-axis parallel to 11a and 11b; See figure 2, element 14)*, further comprising a waveguide core *(See figure 2, element 18; note that the waveguide core extends along the x and y axis, thus the waveguide core is substantially aligned with the first array axis)* substantially aligned with the first array axis.

With respect to **Claim 19**, the touchscreen of claim 15, the second reflective array having a second array axis *(See figure 1, element 13: acoustically reflective elements lying along the y-axis parallel to elements 5a and 5b; See figure 2, element 14)*, further comprising a waveguide core *(See figure 2, element 18; note that the waveguide core extends along the x and y axis, thus the waveguide core is substantially aligned with the second array axis)* substantially aligned with the second array axis.

With respect to **Claim 20**, the touchscreen of claim 15, it is inherent that AAPA teaches the first and second reflective array elements having a focusing shape, since a point at which rays of light diverge, as after reflection have a focal point, then the reflective array elements must have a focusing shape *(See figure 2, element 14, note that*

*the shape is a rectangular plane).*

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claims 4-6, 9, 11, 21, and 23-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claims 1, 12, 15, 16, and 22 above, and further in view of K. G. Schroeder (Patent Number: 3,483,563).

With respect to **Claim 4**, the touchscreen of claim 1, AAPA does not teach at least one reflective array element having a varying width dimension, with a maximum width proximate its center.

Schroeder teaches a reflector having a varying width dimension with a maximum width proximate its center *(See figure 2; column 4, lines 59-65; note that the width of the reflector varies from a width D to a center point of the reflector, the maximum width being equal to D).*

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have at least one reflective array element such that the width has varying dimensions with a maximum width proximate its center, as taught by Schroeder, to the touchscreen of AAPA, so as to provide transmitting and receiving with minimized polarization fading and minimized noise interference *(Schroeder: column 2, lines 32-35).*

With respect to **Claim 5**, the touchscreen of claim 1, AAPA does not teach at least one reflective array element having a varying height dimension, with a maximum height proximate its center.

Schroeder teaches a reflector having a varying height dimension with a maximum height proximate its center *(See figure 2; column 4, lines 59-65; note that the height of the reflector varies from a center point of the reflector when the diameter is of minimum width to the center point of the reflector when the diameter is of maximum width, the maximum height being equal to 4.5)*.

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have at least one reflective array element such that the height has varying dimensions with a maximum height proximate its center, as taught by Schroeder, to the touchscreen of AAPA, so as to provide transmitting and receiving with minimized polarization fading and minimized noise interference *(column 2, lines 32-35)*.

With respect to **Claim 6**, the touchscreen of claim 1, AAPA does not teach at least one reflective array element having both of a varying width dimension and a varying height dimension, with a maximum width and a maximum height proximate its center.

Schroeder teaches a reflector having a varying width dimension with a maximum width proximate its center *(See figure 2; column 4, lines 59-65; note that the width of the reflector varies from a width D to a center point of the reflector, the maximum width being equal to D)*. Schroeder teaches a reflector having a varying height dimension with a maximum height proximate its center *(See figure 2; column 4, lines 59-65; note that the*

*height of the reflector varies from a center point of the reflector when the diameter is of minimum width to the center point of the reflector when the diameter is of maximum width, the maximum height being equal to 4.5).*

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have at least one reflective array element such that the height has varying dimensions with a maximum height proximate its center, as taught by Schroeder, to the touchscreen of AAPA, so as to provide transmitting and receiving with minimized polarization fading and minimized noise interference *(column 2, lines 32-35).*

With respect to **Claim 9**, the touchscreen of claim 1, AAPA does not teach at least one reflective array element having a parabolic profile.

Schroeder teaches a reflective array element having a parabolic profile (See figure 2; *column 4, lines 59-65*).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have at least one reflective array element having a parabolic profile, as taught by Schroeder, to the touchscreen of AAPA, so as to provide transmitting and receiving with minimized polarization fading and minimized noise interference *(column 2, lines 32-35).*

With respect to **Claim 11**, the touchscreen of claim 1, AAPA does not teach at least one reflective array element having a tapered profile.

Schroeder teaches a reflective array element having a tapered profile (See figure 2; *column 4, lines 59-65; note that the reflector tapers at the flat side*).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have at least one reflective array element having a tapered profile, as taught by Schroeder, to the touchscreen of AAPA, so as to provide transmitting and receiving with minimized polarization fading and minimized noise interference *(column 2, lines 32-35).*

With respect to **Claims 21 and 23**, the touchscreen of claims 15 and 22, AAPA does not teach each of the first and second reflective array elements having one or both of a varying width dimension and a varying height dimension, with one or both of a maximum width and a maximum height proximate its center.

Schroeder teaches a reflector having a varying width dimension with a maximum width proximate its center *(See figure 2; column 4, lines 59-65; note that the width of the reflector varies from a width D to a center point of the reflector, the maximum width being equal to D).* Schroeder teaches a reflector having a varying height dimension with a maximum height proximate its center *(See figure 2; column 4, lines 59-65; note that the height of the reflector varies from a center point of the reflector when the diameter is of minimum width to the center point of the reflector when the diameter is of maximum width, the maximum height being equal to 4.5).*

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have each of the first and second reflective array elements having both a varying width dimension and a varying height dimension, with both a maximum width and a maximum height proximate its center, as taught by Schroeder, to the

touchscreen of AAPA, so as to provide transmitting and receiving with minimized polarization fading and minimized noise interference *(column 2, lines 32-35).*

With respect to **Claim 24**, the touchscreen of claim 23, AAPA does not teach each of the first and second array elements having a parabolic profile.

Schroeder teaches a reflective array element having a parabolic profile (See figure 2; *column 4, lines 59-65*).

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have each of the first and second array elements having a parabolic profile, as taught by Schroeder, to the touchscreen of AAPA, so as to provide transmitting and receiving with minimized polarization fading and minimized noise interference *(column 2, lines 32-35).*

With respect to **Claim 25**, the touchscreen of claim 24, further comprising a first transducer *(See figure 1, element 3a)* acoustically coupled to the substrate in the first portion of the border region *(See figure 1, element 15: row)* and positioned to transmit an acoustic signal along the first array axis *([0002], lines 6-9; [0006], lines 9-12)*, and a second transducer *(See figure 1, element 6a)* acoustically coupled to the substrate in the second portion of the border region *(See figure 1, element 15: column)* and positioned to receive an acoustic signal traveling along the second array axis *([0004], lines 10-12).*

4. **Claims 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claim 1 above, and further in view of Blanchard (Patent Number: 6,692,137 B2).

With respect to **Claim 7**, the touchscreen of claim 1, AAPA does not teach at least one reflective array element comprising a groove having a varying depth in a surface of the substrate, with a maximum depth proximate its center.

Blanchard teaches a reflective array element *(See figure 5, element 56)* comprising a groove *(See figure 5, elements 58 and 60)* having a varying depth in a surface of the substrate, with a maximum depth proximate its center *(column 4, lines 59-60; column 9, lines 44-45 and lines 50-53)*.

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have a reflective array element comprising a groove having a varying depth in a surface of the substrate with a maximum depth proximate its center, as taught by Blanchard, to the touchscreen of AAPA, so as to increase the reflection and efficiency of the reflector *(column 3, lines 34-35)*.

With respect to **Claim 8**, the touchscreen of claim 7, AAPA does not teach the substrate comprising a first medium, the groove being at least partially filled with a second medium.

Blanchard teaches the substrate *(See figure 5, element 56)* comprising a first medium, the groove *(See figure 5, elements 58 and 60)* being at filled with a second medium *(See figure 5, element 44; column 9, line 33)*. Please note that although

Blanchard teaches the groove being completely filled with a second medium, the teaching encompasses the limitation of being at least partially filled.

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have the substrate comprising a first medium, the groove being at least partially filled with a second medium, as taught by Blanchard, to the touchscreen of AAPA, so as to provide substantially specular reflection and to provide substantially diffuse reflection *(column 3, lines 39-42).*

5. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Schroeder as applied to claims 1 and 9 above, and further in view of Laming et al. (Patent Number: 6,549,705 B1).

With respect to **Claim 10**, the touchscreen of claim 9, Neither AAPA nor Schroeder mention at least one reflective array element having respective proximal facing and distal facing has convex surfaces.

Laming teaches a biconvex lens in an optical waveguide grating *(See figure 1, element 60: biconvex lens; column 1, lines 7-8; note that a biconvex lens is equivalent to an element having respective proximal facing and distal facing convex surfaces).*

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have an element having respective proximal facing and distal facing convex surfaces, as taught by Laming, as reflective array elements in the touchscreen of AAPA so as to have the advantage of catching and recombining diffracted acoustic waves so as to not introduce any aberrations *(Laming: column 5, lines 51-54).*

6. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claims 1 and 12 above, and further in view of Hiyama et al. (Patent Number: 7,006,173).

With respect to **Claim 14**, the touchscreen of claim 12, AAPA does not teach the reflective array elements underlying the waveguide core.

Hiyama teaches reflective array underlying a waveguide *(See figure 7, element 54: reflector, element 53: waveguide; column 15, lines 21-22).*

It would have been obvious for a person of ordinary skill in the art at the time the invention was made to have a reflective array underlying a waveguide, as taught by Hiyama, as the reflective array elements in the touchscreen of AAPA so as to improve efficiency since the reflector propagates the acoustic waves by reflecting the waves in the waveguide core *(column 15, lines 24-27 and lines 39-42; note that the use of the waveguide and reflector for light is analogous for use with acoustic waves).*

7. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claims 1 and 16 above, and further in view of Waltermann (Patent Number: 7,049,960 B2).

With respect to **Claim 17**, the touchscreen of claim 16, AAPA does not mention both of the first and second transducers comprising a focusing transducer.

Waltermann teaches the use of ultrasonic transducers for broadcasting and receiving acoustic energy, arranged such that they focus on an area of interest *(column 1, lines 46-50; a transducer arranged such that focus is provided to an area of interest is equivalent to a focusing transducer).*

8. It would have been obvious for a person of ordinary skill in the art at the time the invention was made to use a focusing transducer, as taught by Waltermann, as the first and second transducers in the touchscreen of AAPA so as to provide improved accuracy of input detection in the touch sensitive by providing the receiving transducers with a sufficient acoustic signal.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donna V. Lui whose telephone number is (571) 272-4920. The examiner can normally be reached on Monday through Friday 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571)272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Donna V Lui
Examiner
Art Unit 2629

RICHARD HJERPE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600